BUREAU OF INDIAN STANDARDS
DRAFT FOR COMMENTS ONLY

Draft Indian Standard

Photovoltaic System Power Conversion Equipment – Design Qualification And Type Approval

(First Revision)

(ICS 27.160)

Solar Photovoltaic Energy Systems Sectional Committee, ETD 28

Last date for comments- 30 06 2024

NATIONAL FOREWORD

This draft Indian Standard (First Revision) which is Identical with IEC 62093: 2022 'Photovoltaic System Power Conversion Equipment – Design qualification and type approval 'issued by the International Electrotechnical Commission (IEC) will be adopted by the Bureau of Indian Standards on the recommendation of the Solar Photovoltaic Energy Systems Sectional Committee and approval of the Electrotechnical Division Council.

This standard was originally published in 2015 identical to IEC 62093: 2005. The First Revision of this standard has been undertaken to align with the latest version of IEC 62093: 2022.

The text of the IEC Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appears referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker, while in Indian Standards the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to International Standards for which Indian Standards also exists. The corresponding Indian Standards, which are to be substituted, are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*

IEC 60068-2-2: 2007, Environmental testing – Part 2-2: Tests – Test B: Dry heat	IS / IEC 60068-2-2 : 2007 Environmental Testing Part 2 Tests Section 2 Test B Dry Heat	Identical
IEC 60068-2-6, Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)	IS / IEC 60068-2-6 : 2007 Environmental Testing Part 2 Tests Section 6 Test Fc: Vibration (sinusoidal)	Identical
IEC 60068-2-14, Environmental testing – Part 2-14: Tests – Test N: Change of temperature	IS / IEC 60068-2-14 : 2009 Environmental testing Part 2 Tests Section 14 Test N: Change of temperature	Identical
IEC 60068-2-27, Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock	IS 9000 (Part 7/Sec 1) : 2018 / IEC 60068-2-27 : 2008 Basic Environmental Testing Procedures for Electronic and Electrical Items Part 7 Impact Test Section 1 Shock (Test Ea) (*Second Revision*)	Identical
IEC 60068-2-68, Environmental testing – Part 2-68: Tests – Test L: Dust and sand	IS / IEC 60068-2-68 : 1994 Environmental Testing Part 2 Tests Section 68 Test L: Dust and Sand	Identical
IEC 60068-2-78, Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state	IS 9000 (Part 4) : 2020 / IEC 60068-2-78 : 2012 Environmental Testing Part 4 Tests - Test Cab: Damp Heat, Steady State (*Second Revision*)	Identical
IEC 60529:1989, Degrees of protection provided by enclosures (IP Code) IEC 60529:1989/AMD1:1999 IEC 60529:1989/AMD2:2013	IS / IEC 60529 : 2001 Degrees Of Protection Provided By Enclosures (IP CODE)	Identical
IEC 60721-3-3, Classification of environmental conditions – Part 3-3: Classification of groups of environmental parameters and their severities – Stationary use at weather protected locations	IS/IEC 60721-3-3 : 2019 Classification of Environmental Conditions Part 3 Classification of Groups of Environmental Parameters and their Severities Section 3 Stationary use at weather protected locations	Identical
IEC 60721-3-4, Classification of environmental conditions – Part 3-4: Classification of groups of environmental parameters and their severities – Stationary use at non-weather protected locations	IS/IEC 60721-3-4 : 2019 Classification of Environmental Conditions Part 3 Classification of Groups of Environmental Parameters and their Severities Section 4 Stationary use at non-weather protected locations	Identical
IEC 61000-3-2, Electromagnetic compatibility	IS 14700 (Part 3/Sec 2) : 2020 / IEC 61000-3-2 : 2018	Identical

(EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤16 A per phase)	Electromagnetic Compatibility (EMC) Part 3 Limits Section 2 Limits for harmonic current emissions (equipment input current ≤ 16 A per phase) (*Third Revision*)	
IEC 61180, High-voltage test techniques for low-voltage equipment – Definitions, test and procedure requirements, test equipment	IS 16826 : 2018 / IEC 61180 : 2016 High-Voltage Test Techniques for Low-Voltage Equipment — Definitions, Test and Procedure Requirements, Test Equipment	Identical
IEC 61557-1, Electrical safety in low voltage distribution systems up to 1 000 V AC and 1 500 V DC – Equipment for testing, measuring or monitoring of protective measures – Part 1: General requirements	IS/IEC 61557-1 : 2019 Electrical Safety in Low Voltage Distribution Systems Up to 1 000 V a.c. and 1 500 V d.c. — Equipment for Testing, Measuring or Monitoring of Protective Measures Part 1 General Requirements (*First Revision*)	Identical
IEC TS 61836, Solar photovoltaic energy systems – Terms, definitions and symbols	IS 12834 : 2023 / IEC TS 61836 : 2016 Solar Photovoltaic Energy Systems — Terms, Definitions and Symbols (*Second Revision*)	Identical
IEC 62109-1:2010, Safety of power converters for use in photovoltaic power systems – Part 1: General requirements	IS 16221 (Part 1) : 2016 / IEC 62109-1 : 2010 Safety of Power Converters for use in Photovoltaic Power Systems Part 1 General Requirements	Identical
IEC 62116:2014, Utility-interconnected photovoltaic inverters – Test procedure of islanding prevention measures	IS 16169 : 2019 / IEC 62116 : 2014 Utility-Interconnected Photovoltaic Inverters — Test Procedure of Islanding Prevention Measures (*First Revision*)	Identical
IEC 62716:2013, Photovoltaic (PV) modules – Ammonia corrosion testing	IS 16664 : 2018 / IEC 62716 : 2013 Photovoltaic (PV) Modules — Ammonia Corrosion Testing	Identical
IEC 62852, Connectors for DC-application in photovoltaic systems – Safety requirements and tests	IS 16781 : 2018 / IEC 62852 : 2014 Connectors for d.c. Application in Photovoltaic Systems — Safety Requirements and Tests	Identical
IEC 62894:2014, Photovoltaic inverters – Data sheet and name plate IEC 62894:2014/AMD1:2016	IS 16798 : 2018 / IEC 62894 : 2014 Photovoltaic Inverters — Data Sheet and Name Plate	Identical
ISO 4892-2, Plastics – Methods of exposure to laboratory light sources – Part 2: Xenon-arc	IS 17863 (Part 2) : 2022 ISO 4892-2 : 2013 Plastics — Methods of Exposure to Laboratory Light	Identical

lamps	Sources Part 2 Xenon-Arc Lamps	

The technical committee has reviewed the provision of the following International Standard referred in this adopted standard and has decided that it is acceptable for usein conjunction with this standard:

International Standard	*Title*
IEC 60068-2-52	Environmental testing – Part 2-52: Tests – Test Kb: Salt mist, cyclic (sodium, chloride solution)
IEC 60068-2-60: 2015	Environmental testing – Part 2-60: Tests – Test Ke: Flowing mixed gas corrosion test
IEC 60068-3-5: 2018	Environmental testing – Part 3-5: Supporting documentation and guidance – Confirmation of the performance of temperature chambers
IEC 60068-3-6	Environmental testing – Part 3-6: Supporting documentation and guidance – Confirmation of the performance of temperature/ humidity chambers
IEC 61000-3-12	Electromagnetic compatibility (EMC) – Part 3-12: Limits – Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16 A and ≤75 A per phase
IEC TR 61000-3-14	Electromagnetic compatibility (EMC) – Part 3-14: Assessment of emission limits for harmonics, interharmonics, voltage fluctuations and unbalance for the connection of disturbing installations to LV power systems
IEC 62477-1:2012	Safety requirements for power electronic converter systems and equipment – Part 1: General IEC 62477-1:2012/AMD1:2016
IEC TS 63106-2	Basic requirements for simulator used for testing of photovoltaic power conversion equipment – Part 2: DC power simulator
ISO 12103-1:2016	Road vehicles – Test contaminants for filter evaluation – Part 1: Arizona test dust
ISO 22479:2019	Corrosion of metals and alloys – Sulfur dioxide test in a humid atmosphere (fixed gas method)

Only English language text has been retained while adopting it in this Indian Standard, and as such the page numbers given here are not the same as in the International Standard.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test, shall be rounded off in accordance with IS 2: 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

NOTE — The technical content of their document has not been enclosed as there are identical with the corresponding IEC standards for details, please refer the corresponding IEC 62093: 2022 or kindly contact:

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